

CLAIMS

What is claimed is:

1. A method of providing timing information to one or more radio heads connected to a central unit of a wireless communications system, comprising:

5 transferring data between the central unit and at least one radio head via a
 first set of conductors of a first cable using an asynchronous transmit
 method; and
 sending timing data from said central unit to said at least one radio head
 via a second set of conductors of said first cable using a synchronous
10 transmit method.

2. The method of claim 1 wherein transferring data between said central unit
and said at least one radio head via said first set of conductors of said first cable using
an asynchronous transmit method comprises transferring said data between said
central unit and said at least one radio head via said first set of conductors of said first
15 cable using an Ethernet protocol.

3. The method of claim 2 wherein transferring said data between said central
unit and said at least one radio head via said first set of conductors of said first cable
using an Ethernet protocol comprises transferring said data between said central unit
and said at least one radio head via said first set of conductors of said first cable
20 according to 10/100 Base-T Ethernet protocols.

4. The method of claim 1 wherein:

transferring said data between said central unit and said at least one radio
head via said first set of conductors of said first cable using an
asynchronous transmit method comprises transferring said data
between said central unit and said at least one radio head via at least
four conductors of said first cable; and
sending said timing data from said central unit to said at least one radio
head via said second set of conductors of said first cable using a
synchronous transmit method comprises sending said timing data from
said central unit to said at least one radio head via at least two
conductors of said first cable.

5. The method of claim 4 wherein sending said timing data from said central unit
to said at least one radio head via said second set of conductors of said first cable using
a synchronous transmit method comprises sending said timing data from said central
unit to said at least one radio head via said second set of conductors of an unshielded
twisted pair first cable.

6. The method of claim 5 wherein sending said timing data from said central unit
to said at least one radio head via said second set of conductors of an unshielded
twisted pair first cable comprises sending said timing data from said central unit to said
at least one radio head via said second set of conductors of a category 5 Ethernet cable
first cable.

7. The method of claim 1 wherein said at least one radio head comprises at least one wireless radio transceiver and further comprising timing the radio signal transmissions of said wireless radio transceiver of said at least one radio head based on said timing data supplied to said at least one radio head via said second set of
5 conductors of said first cable.

8. The method of claim 1 wherein sending timing data from said central unit to said at least one radio head via said second set of conductors of said first cable using said synchronous transmit method comprises sending Carrier Frequency Reference data from said central unit to said at least one radio head via said second set of
10 conductors using said synchronous transmit method.

9. The method of claim 8 wherein sending Carrier Frequency Reference data from said central unit to said at least one radio head via said second set of conductors of said first cable using said synchronous transmit method comprises sending Carrier Frequency Reference data from said central unit to said at least one radio head via said
15 second set of conductors of said first cable using a synchronous differential transmission method.

10. The method of claim 8 wherein sending timing data from said central unit to said at least one radio head via said second set of conductors of said first cable using said synchronous transmit method further comprises sending Air Frame
20 Synchronization timing data from said central unit to said at least one radio head via said second set of conductors of said first cable using said synchronous transmit method.

11. The method of claim 10 wherein sending Air Frame Synchronization timing data from said central unit to said at least one radio head via said second set of conductors of said first cable using said synchronous transmit method comprises sending Air Frame Synchronization timing data from said central unit to said at least one radio head via said second set of conductors of said first cable using a synchronous differential transmission method.

12. The method of claim 10 wherein said second set of conductors comprises at least four conductors and wherein:

10 sending Carrier Frequency Reference timing data from said central unit to said at least one radio head via said second set of conductors of said first cable comprises sending Carrier Frequency Reference timing data from said central unit to said at least one radio head via a first pair of conductors of said second set of conductors of said first cable; and
15 sending Air Frame Synchronization timing data from said central unit to said at least one radio head via said second set of conductors of said first cable comprises sending Air Frame Synchronization timing data from said central unit to said at least one radio head via a second pair of conductors of said second set of conductors of said first cable.

13. The method of claim 1 further comprising receiving timing information at said central unit from a GPS receiver and wherein sending timing data from said central unit to said at least one radio head via said second set of conductors of said first cable comprises sending timing data based on said timing information from said central unit to said at least one radio head via said second set of conductors.

14. The method of claim 1 wherein said cable is a first cable and said at least one radio head is a first radio head and further comprising:

transferring data between said central unit and a second radio head via a first set of conductors of a second cable using said asynchronous transmit method;

sending timing data from said central unit to said second radio head via a second set of conductors of said second cable using said synchronous transmit method.

15. The method of claim 14 further comprising coordinating the timing of radio transmissions from said first and second radio heads via said timing data supplied to said first radio head via said first cable and via said timing data supplied to said second radio head via said second cable.

16. The method of claim 1:

further comprising receiving timing information at said central unit from a GPS receiver;

wherein said at least one radio head comprises at least one wireless radio transceiver;

wherein said first cable is a category 5 unshielded twisted pair Ethernet

cable and wherein said first set of conductors of said first cable

comprises at least four conductors of said first cable and wherein said second set of conductors of said first cable comprises at least two conductors of said first cable;

wherein sending timing data from said central unit to said at least one
radio head via said second set of conductors of said first cable using
said synchronous transmit method comprises sending Carrier
Frequency Reference data from said central unit to said at least one
radio head via said second set of conductors using said synchronous
transmit method;

wherein sending timing data from said central unit to said at least one
radio head via said second set of conductors of said first cable
comprises sending timing data based on said timing information from
said central unit to said at least one radio head via said second set of
conductors; and

further comprising timing the radio signal transmissions of said wireless
radio transceiver of said at least one radio head based on said timing
data supplied to said at least one radio head via said second set of
conductors of said first cable.

17. The method of claim 16 wherein sending timing data from said central unit to
said at least one radio head via said second set of conductors of said first cable using
said synchronous transmit method further comprises sending Air Frame
Synchronization timing data from said central unit to said at least one radio head via
said second set of conductors of said first cable using said synchronous transmit
method.

18. The method of claim 16 wherein said cable is a first cable and said at least one radio head is a first radio head and further comprising:

transferring data between said central unit and a second radio head via a first set of conductors of a second cable using said asynchronous transmit method;

sending timing data from said central unit to said second radio head via a second set of conductors of said second cable using said synchronous transmit method.

19. The method of claim 18 further comprising coordinating the timing of radio transmissions from said first and second radio heads via said timing data supplied to said first radio head via said first cable and via said timing data supplied to said second radio head via said second cable.

20. A wireless communications transceiver assembly comprising:

a central unit comprising a GPS timing module coupled to a GPS antenna;

a first radio head located remote from said central unit;

a first cable connecting said central unit to said first radio head, said first

5 cable comprising at least a first set of conductors and a second set of
conductors;

wherein data is transferred between said central unit and said first radio

head via first set of conductors of said first cable using an

asynchronous transmit method; and

10 wherein timing data is sent from said GPS timing module to said first radio

head via said second set of conductors of said first cable using a

synchronous transmit method.

21. The assembly of claim 20 wherein said first cable comprises at least six
conductors and wherein said first set of conductors of said first cable comprise at least
15 two pair of conductors and wherein said second set of conductors of said first cable
comprises at least one pair of conductors.

22. The assembly of claim 21 wherein said second set of conductors of said first
cable comprises at least two pair of conductors.

23. The assembly of claim 22 wherein said first cable is a category 5 unshielded
20 twisted pair Ethernet cable.

24. The assembly of claim 21 wherein said at least one pair of conductors of said second set of conductors of said first cable form at least a portion of a differential transmission link between said central unit and said first radio head.

25. The assembly of claim 20 wherein said first radio head comprises at least one wireless radio transceiver and wherein the timing the radio signal transmissions of said wireless radio transceiver of said first radio head is based on said timing data supplied to said first radio head via said second set of conductors of said first cable.

26. The assembly of claim 20 wherein said timing data comprises Carrier Frequency Reference data.

27. The assembly of claim 26 wherein said timing data comprises Carrier Frequency Reference data and Air Frame Synchronization timing data.

28. The assembly of claim 20 further comprising:

a second radio head located remote from said central unit;

a second cable connecting said central unit to said second radio head,

said second cable comprising at least a first set of conductors and a second set of conductors;

wherein data is transferred between said central unit and said second radio head via said first set of conductors of said second cable using an asynchronous transmit method; and

wherein timing data is sent from said GPS timing module to said second radio head via said second set of conductors of said second cable using a synchronous transmit method.

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30. A method of providing timing information to a plurality of radio heads
connected to a central unit of a wireless communications system, comprising:

transferring data between the central unit and a first radio head via a first
set of conductors of a first cable, said first radio head having a wireless
radio transceiver;

transferring data between the central unit and a second radio head via a
first set of conductors of a second cable, said second radio head
having a wireless radio transceiver;

sending timing data from said central unit to said first radio head via a
second set of conductors of said first cable;

sending timing data from said central unit to said second radio head via a
second set of conductors of said second cable;

wherein the timing of radio signal transmissions by said wireless radio
transceiver of said first radio head depends on said timing data
supplied to said first radio head via said second set of conductors of
said first cable; and

wherein the timing of radio signal transmissions by said wireless radio
transceiver of said second radio head depends on said timing data
supplied to said second radio head via said second set of conductors
of said second cable.

5 32. The method of claim 31 wherein said first and second cables are unshielded twisted pair cables.

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